CLAIMS

1. A method for determining thickness of a layer in a structure comprising at least one layer, the method comprising the steps of:

- providing a response signal representing a signal reflected by the structure,
- selecting, from the response signal, a first reflection between a first layer and a previous layer,
- predicting a shape of a further reflection from an interface between the first layer and a subsequent layer,
- locating, in the response signal, the further reflection using the predicted shape of said second reflection,
- determining a duration between the first reflection and the further reflection and, from the determined duration, determining the thickness of the first layer,

wherein the prediction is based upon the first reflection.

2. A method according to claim 1, further comprising the step of:

- transmitting a signal from a point of transmission towards the structure and receiving a reflected signal at a point of reception, so as to provide the response signal.

3. A method according to claim 1, wherein the structure is a multi-layer structure comprising at least two layers.

4. A method according to claim 1, further comprising the steps of:

- from at least one of the first reflection or a second reflection, predicting a shape of a third reflection from an interface between a second layer and a subsequent layer,
- locating, in the response signal, the third reflection using the predicted shape of said third reflection,
- determining a duration between a previous reflection and the third reflection and, from the determined duration, determining the thickness of the second layer.

5. A method according to claim 1, further comprising the steps of:

- from at least one of the first, second or third reflection, predicting a shape of a fourth reflection from an interface between a third layer and a subsequent layer,
- locating, in the response signal, the fourth reflection using the predicted shape of said fourth reflection,
- determining a duration between a previous reflection and the fourth reflection and, from the determined duration, determining the thickness of the third layer.

6. A method according to claim 1, wherein the step of predicting the shape of the further reflection comprises:

- transforming the selected first reflection to a frequency domain,
- applying an attenuation function to said transformed selected first reflection, so as to obtain a representation of the shape in the frequency domain,
- transforming said representation to a time domain, so as to obtain the prediction of the shape.

7. A method according to claim 6, wherein thickness and attenuation properties of the layers of the substrate are used to determine the applied attenuation function.

8. A method according to claim 1, wherein the step of locating comprises:

- in the time domain, shifting the predicted shape between positions in an examination zone comprising at least a part of the response signal,
- for each position, determining a degree of coincidence between the predicted shape and the response signal,
- selecting the position having the best coincidence.

9. A method according to claim 8, wherein determination of the degree of coincidence is based on a calculated difference between the predicted shape and the response signal.

10. A method according to claim 9, wherein the calculated difference is determined on an L1 norm criterion.

11. A method according to claim 9, wherein the calculated difference is determined on a least square criterion.

12. A method according to claim 8, wherein information about the signal transmitted through the materials and attenuation properties of said materials are used to predict the examination zone.

13. A method according to claim 2, wherein a liquid is provided between the point of transmission and the structure.

14. A method according to claim 13, wherein the liquid comprises water.

15. A method according to claim 1, wherein the structure comprises a pipe.

16. A method according to claim 15, wherein the pipe comprises a plurality of layers.

17. A method according to claim 2, wherein duration of the signal transmitted is less than the time required for said signal to cover a first distance, said first distance extending from the point of transmission to an interface between two materials, at least one said two materials being comprised in the structure.

18. A method according to claim 17, wherein the first distance extends between the point of transmission and the first layer.

19. A method according to claim 2, wherein the signal transmitted from the point of transmission is an ultrasonic signal.

20. A method according to claim 1, wherein an outer layer of the structure comprises the first layer.

21. An apparatus for determining thickness of a layer in a structure comprising at least one layer, the apparatus comprising:

- means for transmitting a signal and means for detecting a response signal,
- processing means adapted to process the response signal in accordance with the method of claim 1.

22. An apparatus according to claim 21, wherein the processing means comprises a computer programme adapted to perform the method according to claim 1.

23. A computer system comprising data processing means which co-operates with computer program means to perform the method of claim 1.

24. A computer programme for a computer system according to claim 23.

25. The use of the method according to claim 1, wherein the method is used to determine thickness of layers in a pipe during production of said pipe.